

- 13 -

CLAIMS

1. Device for dry forming a web of fibers, comprising: a fiber distribution head (1); a forming wire (3) movable under said head; a suction means (5) located on the opposite side of said forming wire from said head; within said head, a chamber (9) into which a flow of gas, in which said fibers are suspended, is directed, the chamber having a bottom opening (9A) closed by a screen mesh (17) which is essentially parallel to said forming wire (3) and which faces the latter; and agitator members (45) inside said chamber, above said screen mesh (17), for agitating and distributing the fibers; characterized in that:
- said screen mesh (17) is made to be continuous and movable along a closed path around said chamber, the portion of said mesh parallel to and facing the forming wire moving along a path which is essentially parallel to said forming wire; and
 - said agitator members comprise a plurality of rotating shafts (47) which are parallel to each other and orthogonal to the direction of advance (f3) of said forming wire, said shafts being provided with shaped profiles (51) to agitate the fibers in said chamber.
2. Device according to Claim 1, characterized in that a plurality of diffusers (15) opens into said chamber (9), these diffusers being positioned above the agitator members (45) and being provided with outlets (15A), facing said agitator members, for the admission of said flow of gas and fibers.
3. Device according to Claim 1 or 2, characterized in that said chamber is associated with suction members for sucking in and recycling lumps of fibers which do not pass through said screen mesh.
4. Device according to Claim 3, characterized in that said suction members comprise at least one set of suction inlets (53) adjacent to each other along a direction of alignment which is transverse with respect to the direction of advance of said forming wire.
5. Device according to Claim 4, characterized in that said at least one set of suction inlets is aligned parallel to the axes of rotation of said agitator members.

- 14 -

6. Device according to Claim 4 or 5, characterized in that it comprises two sets of suction inlets (53) located at two opposite ends of the chamber along the direction of advance of the screen mesh.

7. Device according to one or more of the preceding claims,
5 characterized in that said agitator members comprise independent motors (46).

8. Device according to Claim 7, characterized in that said independent motors are bidirectional.

9. Device according to one or more of the preceding claims,
10 characterized in that said shaped profiles (51) carried by said shafts have a configuration with at least one point.

10. Device according to one or more of the preceding claims, characterized in that each of said agitator members comprises a shaft (47) on which is keyed a plurality of disks (49) each of which carries at least one of
15 said shaped profiles (51).

11. Device according to Claim 10, characterized in that each of said profiles has at least one configuration essentially in the form of an isosceles triangle, lying on a cylindrical surface, their sides which converge on the vertex being curved and having their concavity facing the outside of the
20 triangle to form a point.

12. Device according to Claim 10 or 11, characterized in that each of said disks is associated with at least two of said shaped profiles (51), each of which has at least one point.

13. Device according to one or more of the preceding claims,
25 characterized in that a compartment (13) for the introduction of an auxiliary flow of gas is provided above the chamber, holes (11A) being made in a separating partition (11) which separates said compartment (13) from said chamber (9), to allow said auxiliary flow of gas to pass from the compartment (13) to the chamber (9).

30 14. Device according to Claims 2 and 13, characterized in that said diffusers (15) extend from said separating partition (13) towards the interior of the chamber (9).

- 15 -

15. Device according to Claim 2 at least, characterized in that said diffusers (15) are arranged in alignments essentially parallel to the axes of said agitator members (45).

5 16. Device according to Claim 2 at least, characterized in that said diffusers (15) terminate in outlets (15A) elongated in a transverse direction with respect to the direction of advance of said forming wire, and in that the apertures of said outlets and their distance from the screen mesh are such that the jets of gas and suspended fibers from adjacent outlets intersect above the screen mesh.

10 17. Device according to one or more of the preceding claims, characterized in that the distance of said screen mesh (17) from the agitator members (45) is adjustable.

18. Device according to one or more of the preceding claims, characterized in that a portion of said screen mesh (17), forming the bottom
15 closure of said chamber (9), is guided by guide members (93, 95, 97, 99) whose distance from the agitator members (45) is adjustable.

19. Device according to Claim 18, characterized in that said guide members comprise an upper frame (93) and a lower frame (95), essentially parallel to each other and spaced apart from each other, through which said
20 screen mesh (17) passes.

20. Device according to Claim 19, characterized in that said upper and lower frames (93, 95) are supported in a position which is adjustable with respect to the position of the agitator members (45).

21. Device according to Claim 20, characterized in that said upper
25 and lower frames (93, 95) are supported by a sliding block (81) which can be adjusted and clamped on the supporting structure (7) of said head (1).

22. Device according to Claim 21, characterized in that said sliding block (81) supports at least two return rollers (21, 23) of said screen mesh (17), between which extends said portion of the screen mesh which closes the
30 bottom of said chamber.

23. Device according to one or more of Claims 19 to 22, characterized in that said upper frame (93) is integral with a guide section (97)

- 16 -

for said screen mesh (17).

24. Device according to one or more of Claims 19 to 23, characterized in that said lower frame (95) is integral with a guide section (99) for said screen mesh (17).

5 25. Device according to one or more of Claims 18 to 24, characterized in that extendable sealing means (9E, 97B) are positioned between said guide members (93, 95, 97, 99) and the chamber (9) of said forming head (1).

10 26. Device according to Claims 19 and 25 at least, characterized in that said extendable sealing means comprise a section (97, 97B) integral with said upper frame (93) and interacting with a perimetric edge (9E) surrounding the bottom opening (9A) of said chamber.

15 27. Device according to one or more of Claims 18 to 26, characterized in that adjustable sealing means (101) are provided between said guide members and said forming wire (3).

28. Device according to Claims 19 and 27, characterized in that said adjustable sealing means comprise a box (101) open above and below, towards said screen mesh (17) and towards said forming wire (3), supported by said lower frame (95).

20 29. Device according to one or more of the preceding claims, characterized in that it comprises internal cleaning means (61) for cleaning the surface of the screen mesh facing said chamber (9).

30. Device according to Claim 29, characterized in that said internal cleaning means (61) are suction means.

25 31. Device according to one or more of the preceding claims, characterized in that it comprises external cleaning means (65) for cleaning the surface of the screen mesh facing the forming wire (3).

32. Device according to Claim 31, characterized in that said external cleaning means (65) are suction means.

30 33. Device according to one or more of the preceding claims, characterized in that said screen mesh runs around a plurality of return rollers (19, 21, 23, 25, 27, 29), located around said chamber (9) and outside it, at

- 17 -

least one (25) of these rollers being powered.

34. Device according to Claim 33, characterized in that at least one of the return rollers (23) located directly downstream from the bottom opening (9A) of the chamber (9) with respect to the direction of advance (f17) of said screen mesh (17) is associated with doctor blade means (71) for removing
5 any detritus adhering to said roller.

35. Device according to Claim 33 at least, characterized in that at least one (19) of said return rollers is supported in a movable way for tensioning said screen mesh.

10 36. Device according to Claim 33 at least, characterized in that at least one (27) of said return rollers is associated with means of aligning the screen mesh.

37. Device according to Claim 13 at least, characterized in that the assembly formed by said chamber (9) and said compartment (13) is delimited
15 outwardly by a box which is open only next to said screen mesh (17).

38. Device according to Claim 10 at least, characterized in that each of said shaped profiles is symmetrical and has two points orientated in two opposed directions in the tangential direction of said disks.